# XP133A1330SR

TOREX

ETR1113_001

Power MOSFET

## ■GENERAL DESCRIPTION

The XP133A1330SR is an N-channel Power MOSFET with low on-state resistance and ultra high-speed switching characteristics. Two FET devices are built into the one package
Because high-speed switching is possible, the IC can be efficiently set thereby saving energy.
The small SOP-8 package makes high density mounting possible.

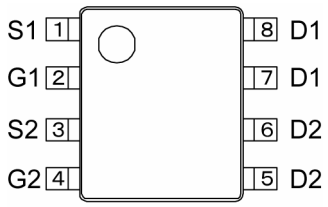
## ■APPLICATIONS

- ●Notebook PCs
- ●Cellular and portable phones
- ●On-board power supplies
- ●Li-ion battery systems

## ■FEATURES

**Low On-State Resistance** : Rds(on)= 0.03Ω (Vgs = 4.5V)
: Rds(on)= 0.04Ω (Vgs = 2.5V)
: Rds(on)= 0.07Ω (Vgs = 1.5V)
**Ultra High-Speed Switching**
**Driving Voltage** : 1.5V
**N-Channel Power MOSFET**
**DMOS Structure**
**Two FET Devices Built-in**
**Package** : SOP-8

## ■PIN CONFIGURATION

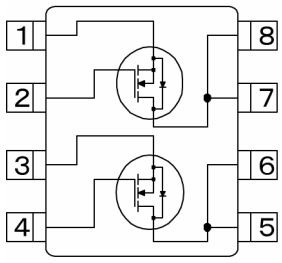



SOP-8
(TOP VIEW)

## ■PIN ASSIGNMENT

| PIN NUMBER | PIN NAME | FUNCTION |
|---|---|---|
| 1 | S1 | Source |
| 2 | G1 | Gate |
| 3 | S2 | Source |
| 4 | G2 | Gate |
| 5~6 | D2 | Drain |
| 7~8 | D1 | Drain |

## ■EQUIVALENT CIRCUIT




N-channel MOSFET
( 2 FET devices built-in )

## ■ABSOLUTE MAXIMUM RATINGS

Ta = 25℃

| PARAMETER | SYMBOL | RATINGS | UNITS |
|---|---|---|---|
| Drain-Source Voltage | Vdss | 20 | V |
| Gate-Source Voltage | Vgss | ±8 | V |
| Drain Current (DC) | Id | 6 | A |
| Drain Current (Pulse) | Idp | 20 | A |
| Reverse Drain Current | Idr | 6 | A |
| Channel Power Dissipation * | Pd | 2 | W |
| Channel Temperature | Tch | 150 | ℃ |
| Storage Temperature Range | Tstg | -55~150 | ℃ |

* When implemented on a glass epoxy PCB

## ■ELECTRICAL CHARACTERISTICS

### DC Characteristics

Ta = 25℃

| PARAMETER | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|---|---|---|---|---|---|---|
| Drain Cut-Off Current | Idss | Vds=20V, Vgs=0V | - | - | 10 | μA |
| Gate-Source Leak Current | Igss | Vgs=±8V, Vds=0V | - | - | ±1 | μA |
| Gate-Source Cut-Off Voltage | Vgs(off) | Id=1mA, Vds=10V | 0.5 | - | 1.2 | V |
| Drain-Source On-State Resistance * | Rds(on) | Id=3A, Vgs=4.5V | - | 0.025 | 0.030 | Ω |
| | | Id=3A, Vgs=2.5V | - | 0.030 | 0.040 | Ω |
| | | Id=1A, Vgs=1.5V | - | 0.045 | 0.070 | Ω |
| Forward Transfer Admittance * | \| Yfs \| | Id=3A, Vds=10V | - | 20 | - | S |
| Body Drain Diode Forward Voltage | Vf | If=6A, Vgs=0V | - | 0.85 | 1.1 | V |

* Effective during pulse test.

### Dynamic Characteristics

Ta = 25℃

| PARAMETER | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|---|---|---|---|---|---|---|
| Input Capacitance | Ciss | Vds=10V, Vgs=0V f=1MHz | - | 950 | - | pF |
| Output Capacitance | Coss | | - | 430 | - | pF |
| Feedback Capacitance | Crss | | - | 180 | - | pF |

### Switching Characteristics

Ta = 25℃

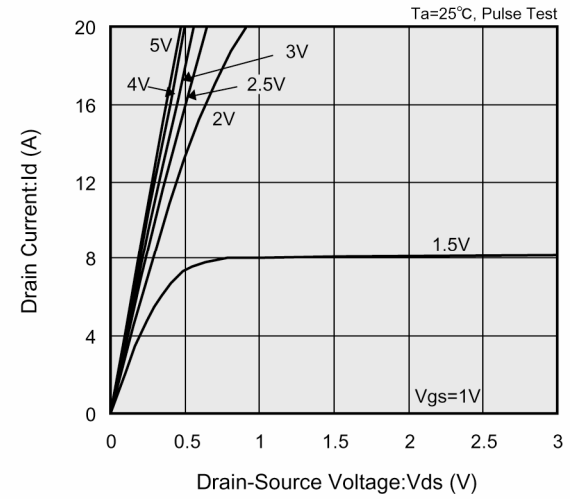
| PARAMETER | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|---|---|---|---|---|---|---|
| Turn-On Delay Time | td (on) | Vgs=5V, Id=3A Vdd=10V | - | 15 | - | ns |
| Rise Time | tr | | - | 20 | - | ns |
| Turn-Off Delay Time | td (off) | | - | 80 | - | ns |
| Fall Time | tf | | - | 15 | - | ns |

### Thermal Characteristics

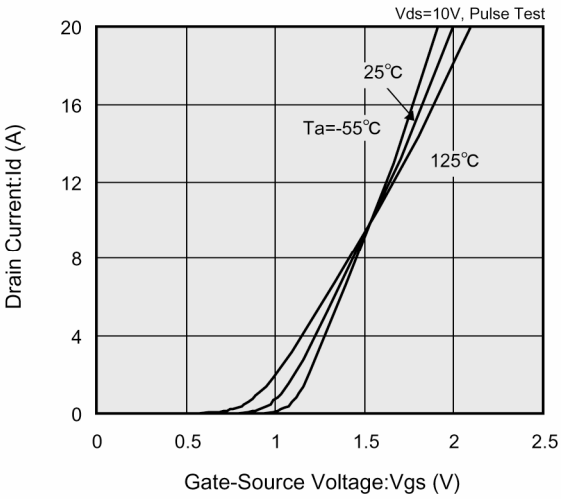
| PARAMETER | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|---|---|---|---|---|---|---|
| Thermal Resistance (Channel-Ambience) | Rth (ch-a) | Implement on a glass epoxy resin PCB | - | 62.5 | - | ℃/W |

# ■TYPICAL PERFORMANCE CHARACTERISTICS

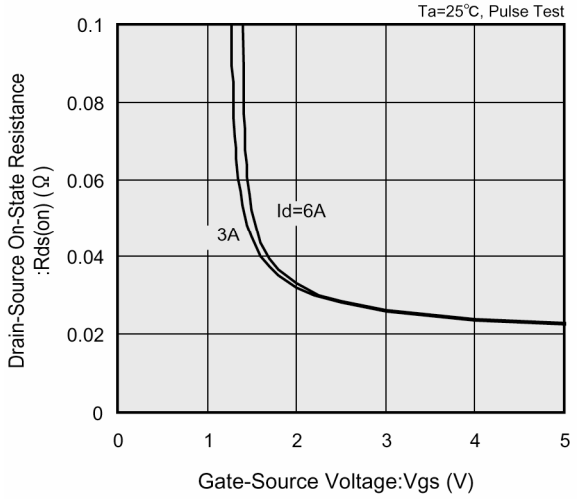
(1) Drain Current vs. Drain-Source Voltage



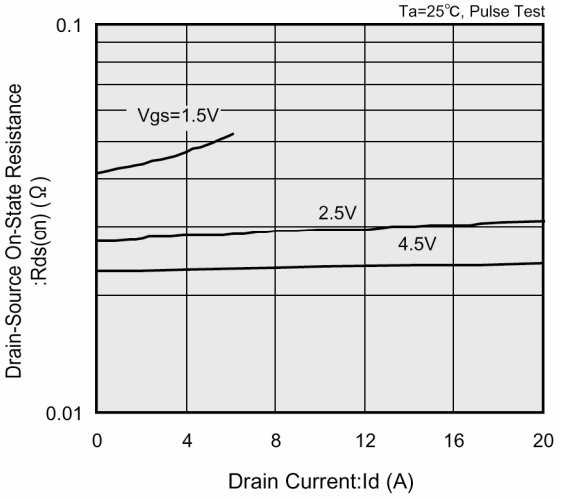

(2) Drain Current vs. Gate-Source Voltage



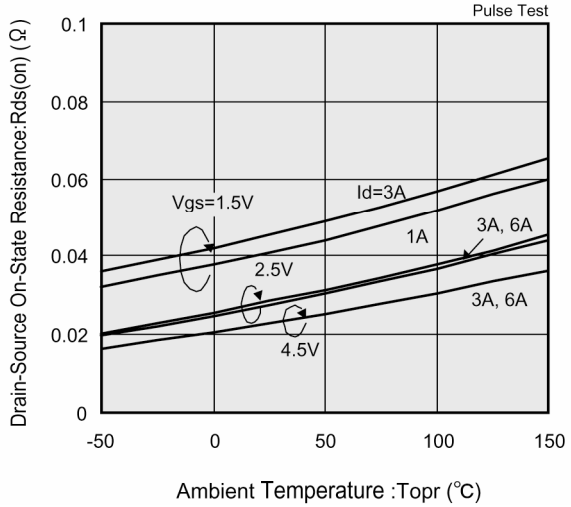

(3) Drain-Source On-State Resistance vs. Gate-Source Voltage



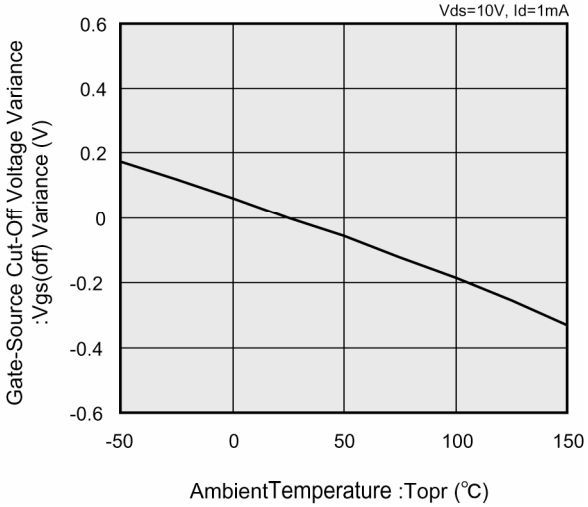

(4) Drain-Source On-State Resistance vs. Drain Current




(5) Drain-Source On-State Resistance vs. Ambient Temperature

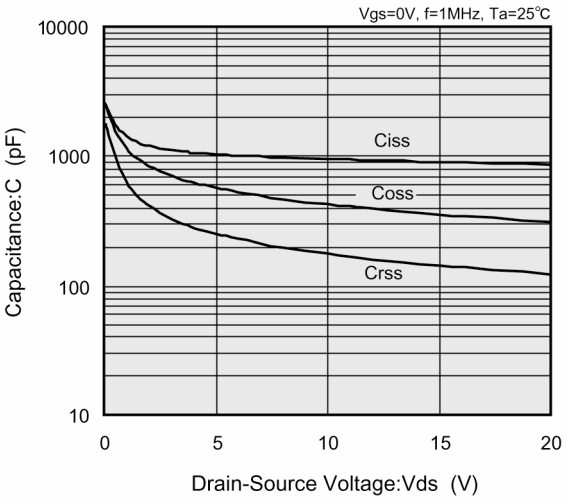



(6) Gate-Source Cut-Off Voltage Variance vs. Ambient Temperature

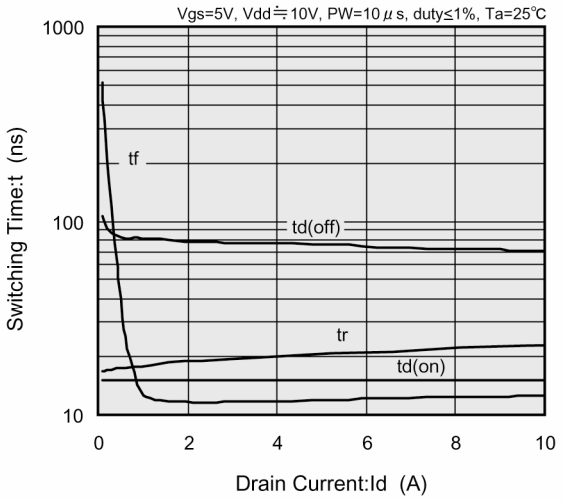


## ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

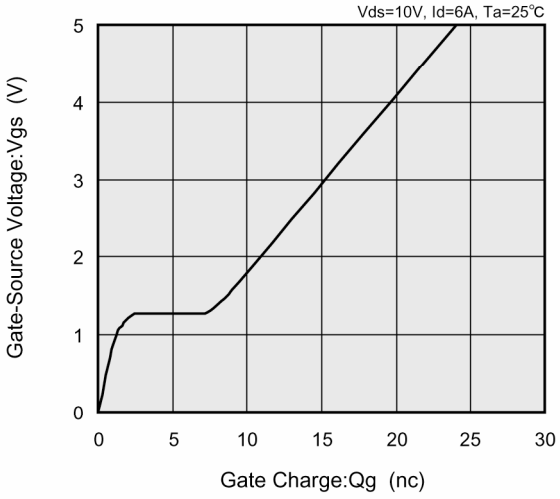
(7) Capacitance vs. Drain-Source Voltage



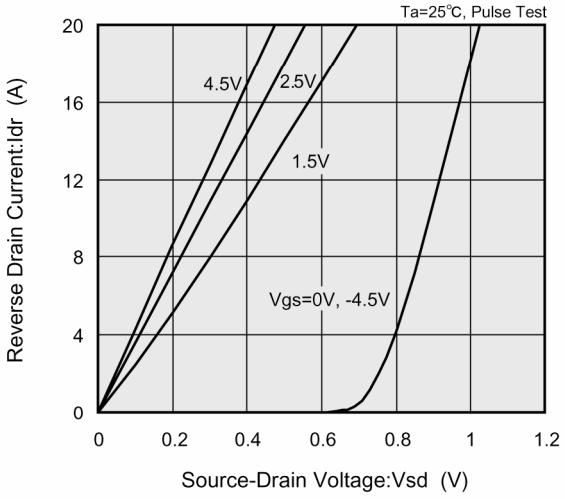

(8) Switching Time vs. Drain Current



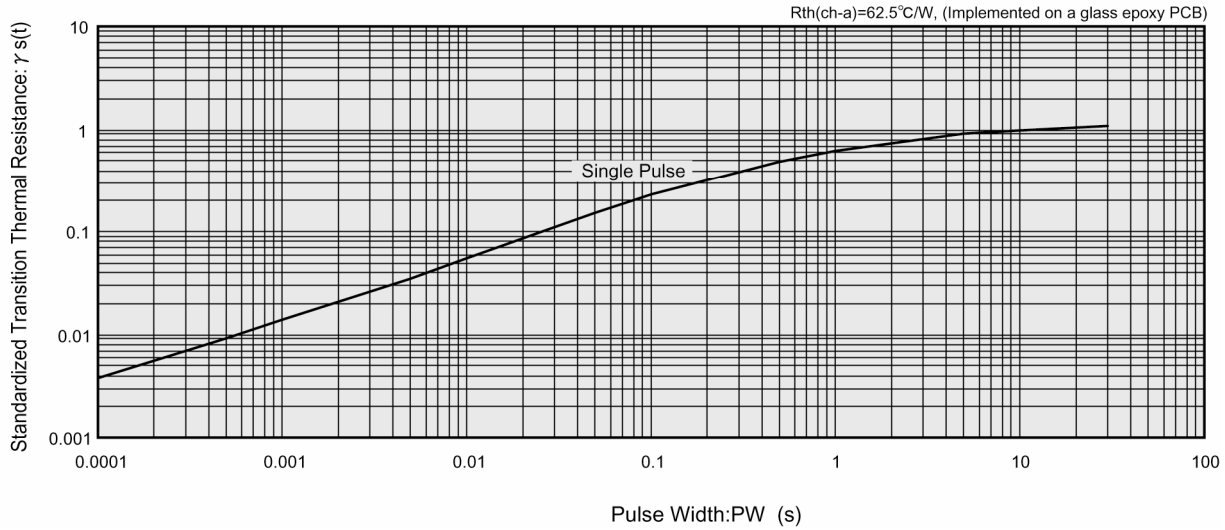

(9) Gate-Source Voltage vs. Gate Charge




(10) Reverse Drain Current vs. Source-Drain Voltage




(11) Standardized transition Thermal Resistance vs. Pulse Width



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